



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/816,080

04/01/2004

Marck Matusz

TH-0996 (US)

8885

23632

7590

06/21/2006

SHELL OIL COMPANY

P O BOX 2463

HOUSTON, TX 772522463

EXAMINER

COVINGTON, RAYMOND K

ART UNIT

PAPER NUMBER

1625

DATE MAILED: 06/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/816,080	<b>Applicant(s)</b> MATUSZ ET AL.	
	<b>Examiner</b> Thomas McKenzie	<b>Art Unit</b> 1625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/27/05</u> . | 6) <input type="checkbox"/> Other: _____  |

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-19 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for epoxidation of olefin by reacting a feed of olefin, oxygen and organic halide using a catalyst wherein the catalyst comprising silver, rhenium wherein the rhenium is present in a quantity of at least 0.1 mmole/kg, based on the total of the elements, relative to the weight of the catalyst, and at most 0.0015 mmole/m<sup>2</sup> relative to the surface area of the carrier, increasing the reaction temperature during the course of the reaction to maintain catalyst activity and maintaining the level of organic halide at the quantity Q wherein the term "relative quantity Q" is a ratio of an effective molar quantity of active halogen species present in the feed to an effective molar quantity of hydrocarbons present in the feed wherein the effective molar quantity of active halogen species present in the feed is calculated by multiplying the molar quantity of each of the organic halides, present in the feed with a factor, and adding up the multiplication products, wherein each factor represents the number of active halogen atoms

present per molecule of the organic halide. See the specification, page 14, line 26 - page 15, line 32.

The specification does not enable any person skilled in the synthetic organic chemistry to make the invention commensurate in scope with these claims. "The factors to be considered [in making an enablement rejection] have been summarized as the quantity of experimentation necessary, the amount of direction or guidance presented, the presence or absence of working examples, the nature of the invention, the state of the prior art, the relative skill of those in that art, the predictability or unpredictability of the art and the breadth of the claims", *In re Rainer*, 146 USPQ 218 (1965); *In re Colianni*, 195 USPQ 150, *Ex parte Formal*, 230 USPQ 546. The direction concerning the catalysts is found in pages 13-17. Pages 24-35 are working examples, all employing the allowed catalysts. The nature of the invention is using known epoxidation catalysts in a particular component content, increasing the reactions temperature during the reaction to maintain the catalyst activity as well as maintaining the halide content based on ratio Q in chemical reactions. The state of the epoxidation process art is that reactant ratios, catalyst content and temperature are critical to a desired product outcome. The predictability of the reaction is empirically found to be low. The artisan using Applicants invention to prepare the claimed compounds would be a

process chemist or pilot plant operator with a BS degree in chemistry and several years of experience. The catalytic arts generally are notoriously unpredictable. U.S. District Court District of Connecticut held in *MOBIL OIL CORPORATION v. W.R. GRACE & COMPANY*, 180 USPQ 418 that “there is an inherent mystery surrounding the unpredictability of the performance of catalysts; a mystery which is generally recognized and acknowledged by chemists in the cracking art. This is one more reason why the presumption of patent validity “should not be disregarded especially in a case of this sort where the intricate questions of chemistry involved are peculiarly within the particular competence of the experts of the Patent Office.” *Merck & Co. v. Olin Mathieson Chemical Corp.*, 253 F.2d 156, 164, 116 USPQ 484, 490 (4th Cir. 1958). “The catalytic action can not be forecast by its chemical composition, for such action is not understood and is not known except by actual test.” *Corona Cord Tire Co. v. Dovan Chemical Corp.*, 276 U.S. 358, 368-369 (1928). Also see, *Application of Grant*, 304 F.2d 676, 679, 134 USPQ 248, 250-251 (CCPA 1962); *Rich Products Corp. v. Mitchell Foods, Inc.*, 357 F.2d 176, 181, 148 USPQ 522, 525-526 (2d Cir. 1966), cert. denied 385 U.S. 821, 151 USPQ 757 (1966); *Ling-Temco-Vought, Inc. v. Kollsman Instrument Corp.*, 372 F.2d 263, 268, 152 USPQ 446, 450-451 (2d Cir. 1967); *Georgia-Pacific Corp. v. United States Plywood Corp.*, 258 F.2d 124, 132-133, 118 USPQ 122, 128-129. h) The

breadth of the claims includes all of the thousands of compounds of formula A as well as the metals copper, silver, gold, zinc, cadmium, and mercury catalysts with presently unknown list of ligands embraced by claim 1.

MPEP 2164.01(a) states, "A conclusion of lack of enablement means that, based on the evidence regarding each of the above factors, the specification, at the time the application was filed, would not have taught one skilled in the art how to make and/or use the full scope of the claimed invention without undue experimentation. *In re Wright*, 999 F.2d 1557,1562, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993)." That conclusion is clearly justified here. Thus, undue experimentation will be required to practice Applicants' invention.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lauritzen et al US 4808738 in view of Shell WO 95/17957, Evans et al US 5418202, and Lauritzen et al EP 00352850.

Lauritzen et al US 4808738 discloses a catalyst for use in olefin epoxidation via olefin, oxygen and halide feed wherein Example 5-2 a silver containing catalyst having 0.5 mmole rhenium per kilogram catalyst. Said catalyst is described in the "Illustrative Embodiment 4" to utilize the support "carrier B", which according to Table 1 is an alpha alumina support having a B.E.T. surface area of 0.42 m<sup>2</sup>/g. By calculation, the distribution of rhenium is 0.0012 mmole/m<sup>2</sup>. It follows from the Table 5, that caesium and sulfur atoms are likewise present in the catalyst. "A promoting amount of rhenium and a promoting amount of a rhenium co-promoter selected from sulfur, molybdenum, tungsten, chromium and mixtures thereof supported on a porous, refractory support" is also part of the catalyst (cf. column 2). Lauritzen et al US 4808738 further discloses in column 3, second paragraph, that silver and rhenium are deposited on a carrier. Lauritzen et al US 4808738 still further discloses (Table 2, claim 2) the use of the above catalyst in the preparation of ethylene oxide starting from a feed mixture comprising ethylene, oxygen, chlorohydrocarbon modifier. In column 20 it is said, that the temperature is increased during the reaction, and that "during the entire test run" the feed mixture consists of 4.4 to 5.6 ppmv vinyl chloride. Given the definition of "a relative quantity Q which is maintained constant" in the present description, all of the features of independent claim 1 are disclosed in Lauritzen et al US 4808738. It

is also stressed that the present definition in the claim, that "the reaction temperature is increased to at least partly reduce the effect of loss of activity of the catalyst", is a functional definition, which does not appear to support the applicant's interpretation, that the disclosed temperature increase in the prior art would not be suitable to meet the said function, namely to reduce an effect of loss of activity of the catalyst. The reference differs in that the specific relative quantity  $Q$  been disclosed.

However, Shell WO 95/17957 discloses as "Illustrative Embodiment 3" a silver containing catalyst having 1.5 mmole rhenium per kilogram catalyst. According to Table VI various alpha alumina supports have been employed. The upper limit of the BET surface area of "Alpha Alumina #1" is 1.4 m<sup>2</sup>/g. By calculation, the distribution of rhenium is 0.001 1 mmole/m<sup>2</sup>. As the surface area of #2 to #3 alpha alumina is even higher, a more loose distribution of rhenium compared to that of the above-mentioned example is present in these embodiments. Further ingredients of the catalyst are caesium and sulfur atoms. "Other promoters in promoting amounts may be optionally present such as rare earths, magnesium, rhenium co-promoters selected from chromium, molybdenum, tungsten and mixture thereof" (page 3). The examples of Shell WO 95/17957 further disclose the use of the catalyst for the epoxidation of ethylene. The feed comprises also



oxygen, chloro hydrocarbon modifiers of 0.3 to 20 ppmv (see Table 1). The temperature is increased during the catalytic process (see page 27). In the light of the above discussed functional definition Shell WO 95/17957 is considered to disclose in combination all features of recited claims.

Evans et al US 5418202 also teach an analogous process involving the use of a silver catalyst in a olefin epoxidation via olefin, oxygen and halide feed reaction. While Evans et al US 5418202 does not teach the Q ratio per se, Evans et al US 5418202 does disclose sufficient data and process parameters to calculate Q. see, for example, column 18 lines 42-47.

Further the above would have been particularly obvious in further view of Lauritzen et al EP 00352850 which also teach an analogous process involving the use of a silver catalyst in a olefin epoxidation via olefin, oxygen and halide feed reaction the process is operated at a level maintaining the selectivity to olefin oxide by modifying the halide level in a manner which corresponds to the Q ratio recited in the claims. see, for example, page 2 lines 37-45 noting also the general process in lines 4-24.

In view of the above it would have been obvious to modify Lauritzen et al US 4808738 to obtain the process parameters recited as the results, the use of

somewhat different but otherwise analogous starting materials in an otherwise known process would not have been unexpected and therefore obvious.

No claim is allowed.

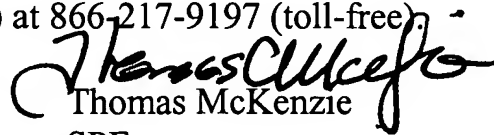
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Covington whose telephone number is (571) 272-0681. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas McKenzie at telephone number (571) 272-0681.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RKC  
*RKC*

  
Thomas McKenzie  
SPE  
Art Unit 1625